PATENT ABSTRACTS OF JAPAN

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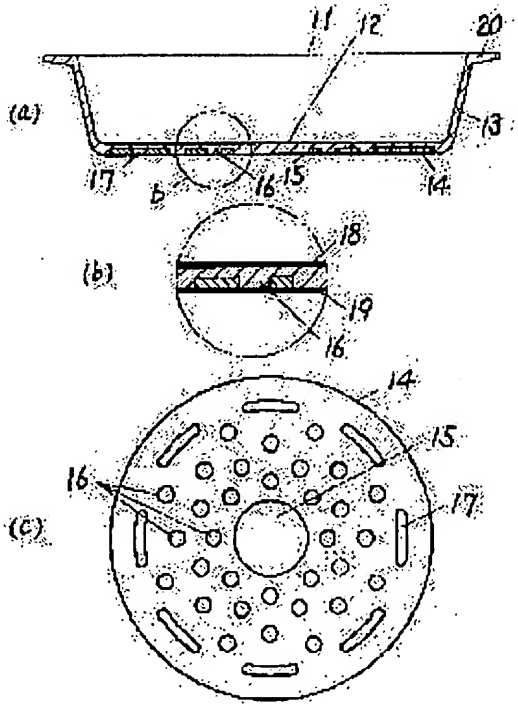
(54) COOKING UTENSIL HEATED FOR ELECTROMAGNETIC INDUCTION HEATING COOKER

(57)Abstract:

PURPOSE: To provide an inexpensive cooking utensil to be heated for electromagnetic induction heating cooker with a simple structure by arranging a magnetic metal plate on the reverse surface of a bottom plate, providing a plurality of through-holes in the magnetic metal plate, and integrally molding the metal plate so that the through-holes are filled with a nonmagnetic metal material.



CONSTITUTION: A magnetic metal plate 14 is integrally molded in the state positioned to a metal mold by a third through-hole 17 at the die-cast molding of a pan body 11. Thus, the metal plate 14 is molded in such a manner that the through-hole 17 is not filled with aluminium alloy, but a first through-hole 15 and a second through hole 16 are filled with the aluminium alloy, and the aluminium alloy never flow onto the outer surface of the metal plate 14. Since a ring high magnetic flux distribution band is formed in a cooker, the heat transfer from the metal plate 14 to the pan inner surface is enhanced with the through-hole 16 as a filling part. By providing an elliptic hole having a concentrical circular arc on the magnetic metal disk in this way, thermal expansion contraction stress is surely

absorbed, and a firm bottom surface with no chamber can be formed.

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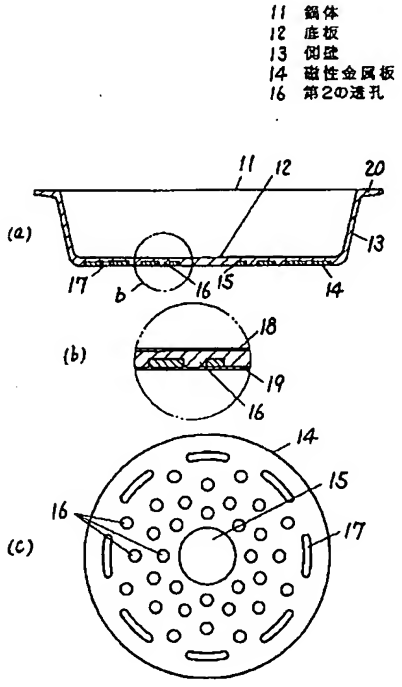
(54)【発明の名称】　電磁誘導加熱調理器用の被加熱調理具

(57)【要約】

【目的】　簡単な構成で安価な電磁誘導加熱調理器用の被加熱調理具の提供を目的とする。

【構成】　非金属材料よりなる鍋体１１の裏面に透孔１５，１６を有する磁性金属板１４を設け，この透孔１５，１６に非金属金属材料が充填されて一体化した構成とする。



1

【特許請求の範囲】

【請求項１】　底板の周縁より側壁が起立する非磁性金属材料よりなる鍋体と、前記底板の裏面に配設される磁性金属板とを有し、この磁性金属板に複数個の透孔を設け、この透孔には前記非磁性金属材料が充填されるように一体に成型した電磁誘導加熱調理器用の被加熱調理具。

【請求項２】　磁性金属材料が充填される透孔は、この外面側が大なる勾配を有してなる請求項１記載の電磁誘導加熱調理器用の被加熱調理具。

【請求項３】　底板の周縁より側壁が起立する非磁性金属材料よりなる鍋体と、前記底板の裏面に配設される円板状の磁性金属板とを有し、この磁性金属板の外周部は前記非磁性金属材料で一体的に取り付けられるとともに、同心円弧を有する透孔を少なくとも半径軸上に複数個配設した電磁誘導加熱調理器用の被加熱調理具。

【請求項４】　底板の周縁より側壁が起立する非磁性金属材料よりなる鍋体と、前記底板の裏面に配設される円板状の磁性金属板とを有し、これと同心円弧を有する第１の透孔を少なくとも半径軸上に複数個配設するとともに、この第１の透孔間に複数個の第２の透孔を設け、この第２の透孔に非磁性金属材料が充填されるように一体に成型した電磁誘導加熱調理器用の被加熱調理具。

【請求項５】　底板の周縁より側壁が起立する非磁性金属材料よりなる鍋体と、前記底板の裏面に配設される磁性金属板とを有し、この磁性金属板に複数個の切り起こし片を形成し、この切り起こし片の上下面に前記非磁性金属材料が充填されるように一体に成型した電磁誘導加熱調理器用の被加熱調理具。

【請求項６】　底板の周縁より側壁が起立する非磁性金属材料よりなる鍋体と、前記底板の裏面に配設される環状の磁性金属板とを有し、この磁性金属板の中央部に鍋体の内側に凸なる環状段部を形成し、この環状段部の上下面に前記非磁性金属材料が充填されるように一体に成型した電磁誘導加熱調理器用の被加熱調理具。

【請求項７】　鍋体をアルミニュームまたはアルミニューム合金とし、磁性金属板の内側をアルミニューム層および外側をステンレス層で一体化したクラッド材で形成した請求項１～６いずれか記載の電磁誘導加熱調理器用の被加熱調理具。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明は、底面に発熱手段を有する電磁誘導加熱調理器用の被加熱調理具に関する。

【０００２】

【従来の技術】一般に、電磁誘導加熱調理器ではアルミ鍋などの非磁性金属鍋を加熱することができないが、鍋底面に各種の加工を施すことにより電磁誘導加熱調理器用に使用できるようになっている。

【０００３】従来の、この種の電磁誘導加熱調理器用の

2

被加熱調理具については、例えば「実公昭６１－２７１０７」号公報に示すような構成になっていた。すなわち図８に示すようにアルミニュームまたはアルミニューム合金製の容器本体１０１の底部１０２にブラスト処理を施した後、磁性材層としての鉄の溶射層１０３を形成したものが一般的であった。１０４は内面加工層を示す。

【０００４】

【発明が解決しようとする課題】このような従来の電磁誘導加熱調理器用の被加熱調理具では，第１の課題として例えば１ｋｗ以上の出力を得るためには容器本体１０１の底面の溶射層１０３の厚さを０．５ｍｍから１．０ｍｍ必要とし、溶射材料コストおよびこの加工コストが大であった。このために、溶射層１０３の厚さを出力との相関で決定し極力薄く形成することが望ましいが、この種の加工では、溶射層１０３の厚さを均一に形成することが困難であり、安定した出力を得られなかった。さらに第３の課題として、この種の溶射層１０３は硬質であるが、衝撃に対して脆く、例えば誤って鍋を落下したとき溶射層１０３が剥離することがあり、また加熱時、容器本体１０１を構成するアルミニュームの膨張率が溶射材料よりも大であるため、鍋底に反りが発生するとともに溶射層１０３にクラックが入り、加熱されなくなる恐れがあった。これらは高出力を得るために溶射層を厚く形成するほど顕著な課題となっていた。

【０００５】本発明は上記課題を解決するもので，簡単な構成で，安価で堅牢にして使い勝手がよく安全に調理ができる電磁誘導加熱調理器用の被加熱調理具を提供することを目的とするものである。

【０００６】

【課題を解決するための手段】上記目的を達成するために本発明の第１の課題解決手段は，底板の周縁より側壁が起立する非磁性金属材料よりなる鍋体と、前記底板の裏面に配設される磁性金属板とを有し、この磁性金属板に複数個の透孔を設け、この透孔に前記非磁性金属材料が充填されるように一体に成型した電磁誘導加熱調理器用の被加熱調理具の構成としたものである。

【０００７】第２の課題解決手段は、磁性金属材料が充填される透孔の、この外面側が大なる勾配を有する構成としたものである。

【０００８】第３の課題解決手段は、底板の周縁より側壁が起立する非磁性金属材料よりなる鍋体と、前記底板の裏面に配設される円板状の磁性金属板とを有し、この磁性金属板の外周部は前記非磁性金属材料で一体的に取り付けられるとともに、同心円弧を有する透孔を少なくとも半径軸上に複数個配設した電磁誘導加熱調理器用の被加熱調理具の構成としたものである。

【０００９】第４の課題解決手段は、底板の周縁より側壁が起立する非磁性金属材料よりなる鍋体と、前記底板の裏面に配設される円板状の磁性金属板とを有し、これと同心円弧を有する第１の透孔を少なくとも半径軸上に

複数個配設するとともに、この第１の透孔間に複数個の第２の透孔を設け、この第２の透孔に非磁性金属材料が充填されるように一体に成型した電磁誘導加熱調理器用の被加熱調理具の構成としたものである。

【００１０】第５の課題解決手段は底板の周縁より側壁が起立する非磁性金属材料よりなる鍋体と、前記底板の裏面に配設される磁性金属板とを有し、この磁性金属板に複数個の切り起こし片を形成し、この切り起こし片の上下面に前記非磁性金属材料が充填されるように一体に成型した電磁誘導加熱調理器用の被加熱調理具の構成としたものである。

【００１１】第６の課題解決手段は、底板の周縁より側壁が起立する非磁性金属材料よりなる鍋体と、前記底板の裏面に配設される環状の磁性金属板とを有し、この磁性金属板の中央部に鍋体の内側に凸なる環状段部を形成し、この環状段部の上下面に前記非磁性金属材料が充填されるように一体に成型した電磁誘導加熱調理器用の被加熱調理具の構成としたものである。

【００１２】第７の課題解決手段は、前記第１～４の解決手段の鍋体をアルミニュームまたはアルミニューム合金とし、磁性金属板の内側をアルミニューム層および外側をステンレス層で一体化したクラッド材で形成した構成としたものである。

【００１３】

【作用】上記した第１の課題解決手段では底板の周縁より側壁が起立する非磁性金属材料よりなる鍋体と、前記底板の裏面に配設される磁性金属板とを有し、この磁性金属板に複数個の透孔を設け、この透孔に前記非磁性金属材料が充填されるように一体に成型したため、たとえばダイカスト成型時に一体に成型するだけで極めて安価に被加熱調理具が構成される。

【００１４】第２の課題解決手段は、前記磁性金属板の外面側が大なる勾配を有する透孔を設けた構成としたため、熱で膨張収縮しても磁性金属板が外れることがない。

【００１５】また第３の課題解決手段では磁性金属板の外周部は前記非磁性金属材料で一体的に取り付けられるとともに、同心円弧を有する透孔を少なくとも半径軸上に複数個配設したため、この透孔により外周部の膨張収縮応力が吸収され磁性金属板の反りが少なくなる。

【００１６】また第４の解決手段は磁性金属板と同心円弧を有する第１の透孔を少なくとも半径軸上に複数個配設するとともに、この第１の透孔間に複数個の第２の透孔を設け、この第２の透孔に非磁性金属材料が充填されるように一体に成型したため、第２の透孔に充填された非金属材料に加わる膨張収縮応力が少なく確実に一体化される。

【００１７】また第５の課題解決手段では電磁誘導加熱調理器用の被加熱調理具の構成底板の周縁より側壁が起立する非磁性金属材料よりなる鍋体と、前記底板の裏面

に配設される磁性金属板とを有し、この磁性金属板に複数個の切り起こし片を形成し、この切り起こし片の上下面に前記非磁性金属材料が充填されるように一体に成型したため、衝撃が加わったり、熱により膨張収縮しても磁性金属板がぐらつくことがなく、確実に一体化される。

【００１８】また第６の課題解決手段では底板の周縁より円筒状の側壁が起立する非磁性金属材料よりなる鍋体と、前記底板の裏面に配設される環状の磁性金属板とを有し、この磁性金属板の中央に鍋体の内側に凸なる環状段部を形成したため、熱で膨張収縮しても強度が充分であるため、例えば鍋をずらして加熱されるような局部的な加熱をおこなっても、磁性金属板のねじれ変形が防止でき、鍋底の平面度が確保される。

【００１９】また第７の課題解決手段では鍋体をアルミニュームまたはアルミニューム合金とし、磁性金属板の内側をアルミニューム層および外側をステンレス層で一体化したクラッド材で形成した構成としたため、鍋体と磁性金属板との接合面は相互の熱膨張差が極めて少ないため隙間のない安定した接合状態が得られる。

【００２０】

【実施例】

（実施例１）以下、本発明の第１の実施例を図１を参照しながら説明する。

【００２１】図において、１１は電磁誘導加熱調理器用の被加熱調理具であり、底板１２の周縁より円筒状の側壁１３が起立する鍋体であり、アルミニューム合金よりなる。１４は円形状の磁性金属板であり、板厚１～３ｍｍの鉄やフェライト系のステンレス鋼板よりなるプレス成型品あるいは鋳鉄等の鋳造品よりなり、中央に第１の透孔１５、この周囲に第二の複数個の透孔１６、外周部に第３の長穴状の透孔１７が設けてある。１８は四ふっ化エチレン樹脂等よりなるふっそ樹脂皮膜であり、外面にはシリコン樹脂等よりなる防錆樹脂皮膜１９を形成してある。２０は把手を示す。

【００２２】上記構成において本発明の被加熱調理具はダイカスト成型で加工されるもので、磁性金属板１４は前記鍋体のダイカスト成型時に，第３の透孔１７により、金型に位置決め固定された状態で，一体に成型されるものである。従って第３の透孔１７にはアルミニューム合金が充填されないが、第１の透孔１５および第２の透孔１６にはアルミニューム合金が充填され、また磁性金属板１４の外面にはアルミニューム合金が流れ込まないように成型されている。成型直後はアルミニューム合金の線膨張係数が磁性金属板１４のそれよりも大であるため、周囲のアルミニューム合金の収縮により、磁性金属板１４には圧縮応力が加わるが、前記第３の透孔１７により吸収され、第１の透孔１５および第２の透孔１６のアルミニューム充填部への応力が軽減される。以上は成型時の収縮を想定したものであるが、使用時において

5

も同様である。ただし一般にダイカスト成型では７００℃以上の高温状態となるため、成型直後は極めて大きな収縮応力が発生するが、使用時は３００℃以下の温度であるため、これ以上の応力が発生することはない。本発明では第１の透孔１５を充填部としたが、圧縮応力をさらに吸収するため非充填部、すなわち穴部としてもよい。一般にこの種の調理器においては円環状の高磁束分布帯となるため、第２の透孔１６を充填部として磁性金属板１４から鍋内面への熱伝導を高めるのが良い。また本発明ではアルミダイカスト成型としたがその他の成型方法でもよく、要は非金属材料が充填される穴部と充填されない穴部を有する磁性金属板１４を一体に成型すれば良い。

【００２３】（実施例２）次に第２の実施例について図２を参照しながら説明する。

【００２４】図において、２１は電磁誘導加熱調理器用の被加熱調理具であり、底板２２の周縁より円筒状の側壁２３が起立する鍋体であり、アルミニューム合金よりなる。

【００２５】２４は円形状の磁性金属板であり、板厚１～３ｍｍの鉄やフェライト系のステンレス鋼板よりなるプレス成型品あるいは鋳鉄等の鋳造品よりなり、中央に第１の透孔２５、この周囲に第二の複数個のテーパを有する透孔２６が設けてある。２８は四ふっ化エチレン樹脂等よりなるふっそ樹脂皮膜であり、外面にはシリコン樹脂等よりなる防錆樹脂皮膜２９を形成してある。３０は把手である。２６aは角アールを示す。

【００２６】上記構成において第２の透孔２６は逆テーパ状になっているため、この穴部に充填されたアルミニューム合金が使用時熱で膨張収縮をしても、磁性金属板２４が浮き上がったり外れる恐れはない。このテーパ孔である透孔２６の外面側円周部はエッジ状にすることにより、成型時外面への充填漏れ（バリ）を防止しやすくなる。また内面側円周部には角アール２６aを設けて、該当部のアルミニュウム合金の充填を安定させ、かつ加熱膨張時の応力集中を避けるようにするのが望ましい。

【００２７】（実施例３）次に第３の実施例について図３を参照しながら説明する。

【００２８】図において、３１は電磁誘導加熱調理器用の被加熱調理具であり、底板３２の周縁より円筒状の側壁３３が起立する鍋体であり、アルミニューム合金よりなる。

【００２９】３４は円形状の磁性金属板であり、板厚１～３ｍｍの鉄やフェライト系のステンレス鋼板よりなるプレス成型品あるいは鋳鉄等の鋳造品よりなり、同心円弧を有する第１の透孔３５を少なくとも半径軸上に複数個形成されるように配設するとともに中央には第２の透孔３６を設けてある。３７は四ふっ化エチレン樹脂等よりなるふっそ樹脂皮膜であり、外面にはシリコン樹脂等よりなる防錆樹脂皮膜３８を形成してある。３９は把手を示す。

6

【００３０】上記構成において本発明の被加熱調理具はダイカスト成型で加工されるもので、磁性金属板３４はこの外周部および中央の第２の透孔３６にアルミニューム合金が充填され、一体に成型されるようになっている。ここで第１の透孔３５にはアルミニューム合金が充填されず、また磁性金属板３４の外面にはアルミニューム合金が流れ込まないように成型されている。成型直後はアルミニューム合金の線膨張係数が磁性金属板３４のそれよりも大であるため、外周のアルミニューム合金の収縮により、磁性金属板３４外周には圧縮応力が加わるが、前記第１の透孔３５により吸収される。この第１の透孔３５は半径軸上に少なくとも２箇所配設されているため、全面で応力が吸収され、磁性金属板３４の反りが少なくなる。以上は成型時の収縮を想定したものであるが、使用時においても同様である。ただし一般にダイカスト成型では７００℃以上の高温状態となるため、成型直後は極めて大きな収縮応力が発生するが、使用時は３００℃以下の温度であるため、これ以上の応力が発生することはない。

【００３１】（実施例４）次に第４の実施例について図４を参照しながら説明する。

【００３２】図において、４１は電磁誘導加熱調理器用の被加熱調理具であり、底板４２の周縁より円筒状の則壁４３が起立する鍋体であり、アルミニューム合金よりなる。

【００３３】４４は円形状の磁性金属板であり、板厚１～３ｍｍの鉄やフェライト系のステンレス鋼板よりなるプレス成型品あるいは鋳鉄等の鋳造品よりなり、同心円弧を有する第１の透孔４５を少なくとも半径軸上に複数個形成されるように配設するとともに、この第１の透孔４５間に複数個の第２の透孔４６を設け、この第２の透孔４６に非磁性金属材料が充填されるように一体に成型してある。４７は四ふっ化エチレン樹脂等よりなるふっそ樹脂皮膜であり、外面にはシリコン樹脂等よりなる防錆樹脂皮膜４８を形成してある。４９は把手を示す。

【００３４】上記構成において本発明の被加熱調理具はダイカスト成型で加工されるもので、磁性金属板４４が一体に成型されるようになっている。ここで第１の透孔４５にはアルミニューム合金が充填されないが、第２の透孔４６にはアルミニューム合金が充填され、また磁性金属板４４の外面にはアルミニューム合金が流れ込まないように成型されている。成型直後はアルミニューム合金の線膨張係数が磁性金属板４４のそれよりも大であるため、周囲のアルミニューム合金の収縮により、磁性金属板４４外周には圧縮応力が加わるが、前記第１の透孔４５により吸収される。この第１の透孔は半径軸上に少なくとも２箇所配設されているため、全面で応力が吸収され、磁性金属板４４の反りが少なくなる。また第２の透孔４６は、第１の透孔４５の間に配設されているた

め、この第2の透孔４６のアルミニューム充填部のせん断応力は軽減されるため、この根元が膨張収縮で破損して磁性金属板４４が外れる恐れがない。以上は成型時の収縮を想定したものであるが、使用時においても同様である。ただし一般にダイカスト成型では７００℃以上の高温状態となるため、成型直後は極めて大きな収縮応力が発生するが、使用時は３００℃以下の温度であるため、これ以上の応力が発生することはない。

【００３５】（実施例５）次に第５の実施例について図５を参照しながら説明する。

【００３６】図において、５１は電磁誘導加熱調理器用の被加熱調理具であり、底板５２の周縁より円筒状の側壁５３が起立する鍋体であり、アルミニューム合金よりなる。

【００３７】５４は円形状の磁性金属板であり、板厚１～３ｍｍの鉄やフェライト系のステンレス鋼板よりなり、鍋体内面側に起立する複数個の切り起こし片５５と、この周囲にはU字状の透孔５６が形成されている。５７は四ふっ化エチレン樹脂等よりなるふっそ樹脂皮膜であり、外面にはシリコン樹脂等よりなる防錆樹脂皮膜５８を形成してある。５９は把手を示す。

【００３８】上記構成において本発明の被加熱調理具はダイカスト成型で加工されるもので、透孔５６を通り、切り起こし片５５上下面に連続してアルミニューム合金が充填され、磁性金属板外面には回り込まないように一体に成型されるようになっている。またこの切り起こし片５５の上下のアルミニューム合金の肉厚はほぼ等しくなるように前記切り起こし高さを設定してある。このため加熱で膨張収縮が繰り返されても磁性金属板４１がぐらつくことがなく確実に一体化される。

【００３９】次に第６の実施例について図６を参照しながら説明する。図において、６１は電磁誘導加熱調理器用の被加熱調理具であり、底板６２の周縁より円筒状の側壁６３が起立する鍋体であり、アルミニューム合金よりなる。

【００４０】６４は円形状の磁性金属板であり、板厚１～３ｍｍの鉄やフェライト系のステンレス鋼板よりなるプレス成型品あるいは鋳鉄等の鋳造品よりなり、中央部には鍋体の内側に凸なる環状段部６５および複数個の透孔６６を有する。６７は四ふっ化エチレン等よりなるふっそ樹脂皮膜であり、外面にはシリコン樹脂等よりなる防錆樹脂皮膜６８を形成してある。６９は把手を示す。

【００４１】上記構成において本発明では磁性金属板６４は前記鍋体のダイカスト成型時に一体に成型され，この時環状段部６５の上下面および透孔６６にアルミニューム合金が充填されるが外面にはアルミニューム合金が流れ込まないように成型されている。また、環状段部６５の上下のアルミニューム合金の肉厚はほぼ等しくなるように段高さを設定してある。ダイカスト成型では、成型後の外周部のアルミニュウム合金の収縮で中央部の変形が最も大きくなるように作用するが、前記環状段部６５の機械的強度により、変形が阻止される。以上は成型時の収縮を想定したものであるが、使用時においても、例えば鍋をずらして使用する等の局部的な加熱がされて、膨張収縮が繰り返されても、ねじれ変形が生じにくい。一般にこの種の調理器においては円環状の交番磁束発生コイルを有しているが、この内周径に等しい環状段部６５を形成するのがよい。

【００４２】（実施例７）次に第７の実施例について図７を参照しながら説明する。

【００４３】図において、９１は電磁誘導加熱調理器用の被加熱調理具であり、底板９２の周縁より円筒状の側壁９３が起立する鍋体であり、アルミニューム合金よりなる。

【００４４】９４は円形状の磁性金属板であり、内側をアルミニューム層９５および外側をステンレス層９６で一体化したクラッド材で形成してあり、その他の構成は実施例６に同じである。

【００４５】上記構成において本発明では磁性金属板９４を前記鍋体のダイカスト成型時に一体に成型されるものでクラッド材のアルミニューム層９５と鍋体のアルミニューム合金が接合面となるため、いわゆる湯ぎらいがなく、安定した成型が可能となる。また使用時の膨張差も近似であるため、常に一体化して膨張収縮するため加熱層となるステンレス層９６からの熱伝導が確実であり効率的な被加熱調理具が実現できる。またステンレス層９６は０．５ｍｍ程度の厚さでよく、軽量な被加熱調理具となる。本実施例では、前記実施例６に同じ構成としたが、その他の実施例でも可能であることは言うまでもない。

【００４６】

【発明の効果】前記実施例の説明より明らかなように本発明の電磁誘導加熱調理器用の被加熱調理具は、アルミ等の非磁性金属でも底面に磁性金属板を一体に成型することにより、極めて安価で簡単な構成にして加熱する事ができる。また磁性金属板に逆勾配の透孔を形成することにより、容易に磁性金属板の外れが防止できる。また磁性金属板に同心円弧を有する長穴を設けることにより、熱膨張収縮応力は確実に吸収され、反りのない、堅牢な底面が形成できる。また磁性金属円板に同心円弧を有する長穴を設け、この間に非磁性金属材料が充填される透孔を配設することにより、より確実に一体化される。また磁性金属板に一体に切り起こし片を設け、この上下面にアルミニュウム合金が充填されるようにすることにより、熱膨張収縮による磁性金属板のぐらつきが確実に防止される。また磁性金属板中央部に環状段部を形成することにより、薄板であっても強固であり、局部的な加熱に対しても、磁性金属板のねじれ変形が防止できる。また磁性金属板をクラッド材とすることにより、接合面の膨張収縮差が極めて少なくなくなり、確実に一体

化を確保し、かつ高効率で良好な熱伝導がされる。

【図面の簡単な説明】

【図1】（a）は本発明の第1の実施例の電磁誘導加熱調理器用の被加熱調理具の断面図

（b）は図1（a）中の矢示bに相応する部位の部分拡大図

（c）は同磁性金属板の平面図

【図2】（a）は本発明の第2の実施例の電磁誘導加熱調理器用の被加熱調理具の断面図

（b）は図2（a）中の矢示bに相応する部位の部分拡大図

（c）は同磁性金属板の裏面図

【図3】（a）は本発明の第3の実施例の電磁誘導加熱調理器用の被加熱調理具の断面図

（b）は図3（a）中の矢示bに相応する部位の部分拡大図

（c）は同磁性金属板の裏面図

【図4】（a）は本発明の第4の実施例の電磁誘導加熱調理器用の被加熱調理具の断面図

（b）は図4（a）中の矢示bに相応する部位の部分拡大図

（c）は同磁性金属板の裏面図

【図5】（a）は本発明の第5の実施例の電磁誘導加熱調理器用の被加熱調理具の断面図

（b）は図5（a）中の矢示bに相応する部位の部分拡大図

（c）は同磁性金属板の裏面図

【図6】（a）は本発明の第6の実施例の電磁誘導加熱調理器用の被加熱調理具の断面図

（b）は図6（a）中の矢示bに相応する部位の部分拡大図

（c）は同磁性金属板の裏面図

【図7】（a）は本発明の第7の実施例の電磁誘導加熱調理器用の被加熱調理具の断面図

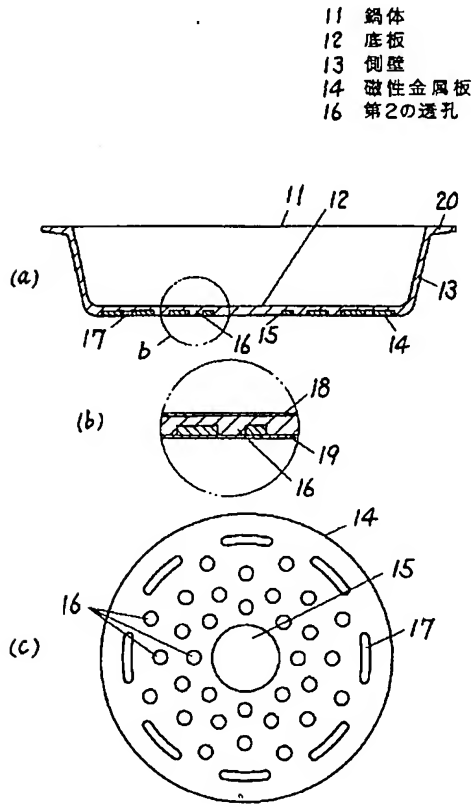
（b）は図7（a）中の矢示bに相応する部位の部分拡大図

【図8】従来の実施例の電磁誘導加熱調理器用の被加熱調理具の断面図

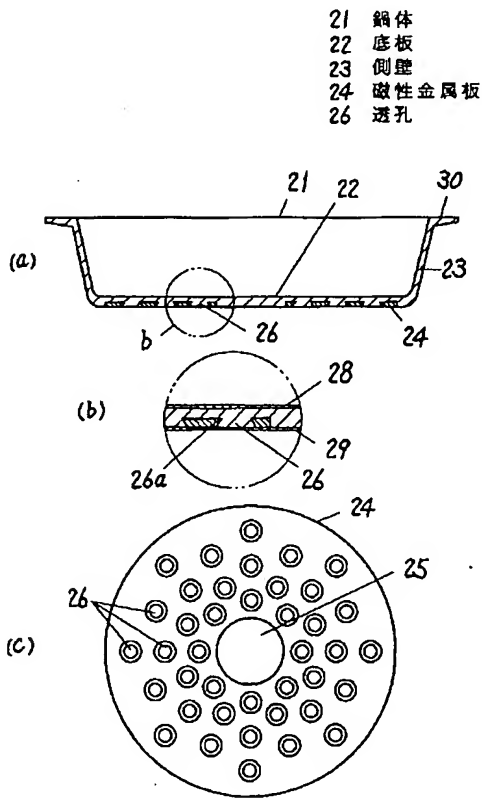
【符号の説明】

11　鍋体
12　底板
13　側壁
14　磁性金属板
16　透孔

【図1】

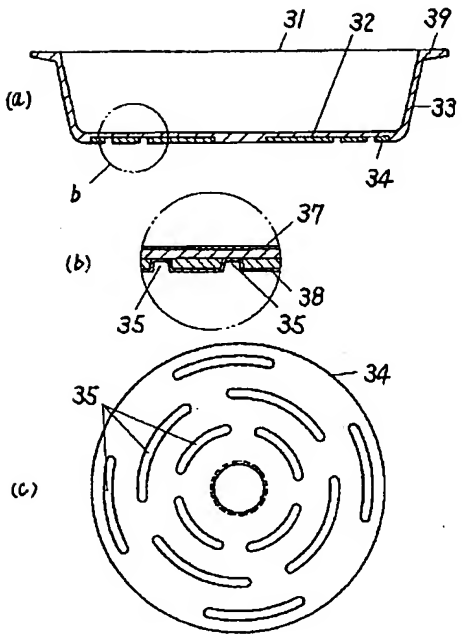


【図2】



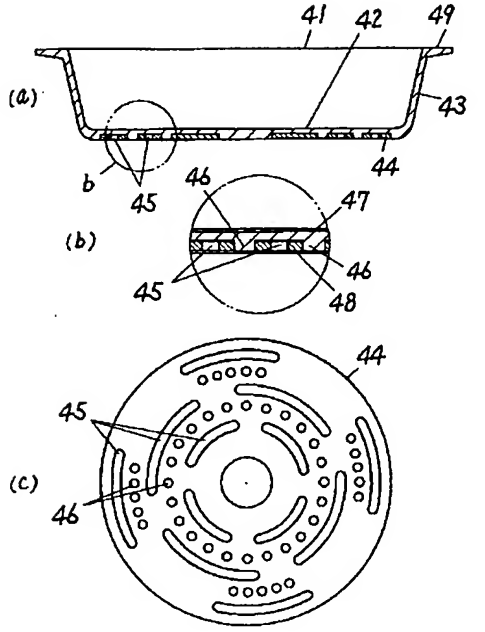
【図3】

31 鍋体
32 底板
33 側壁
34 磁性金属板
35 第1の透孔



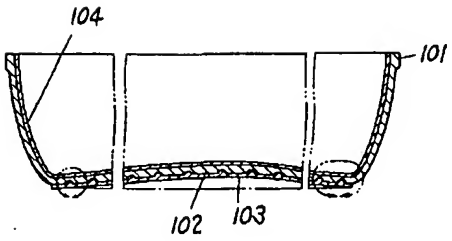
【図4】

41 鍋体
42 底板
43 側壁
44 磁性金属板
45 第1の透孔
46 第2の透孔



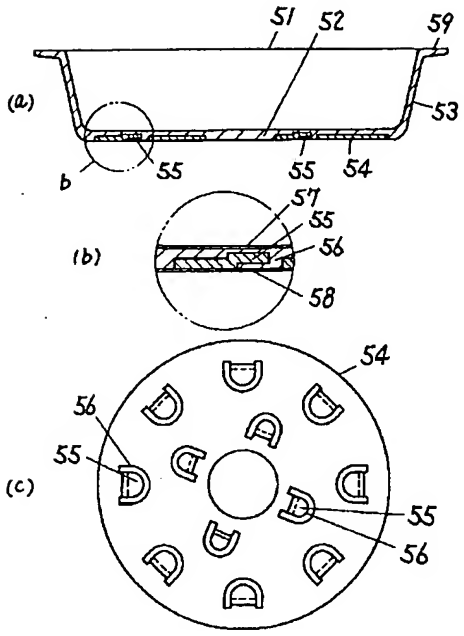
【図8】

101 容器本体
102 底部
103 溶射層
104 内面加工層



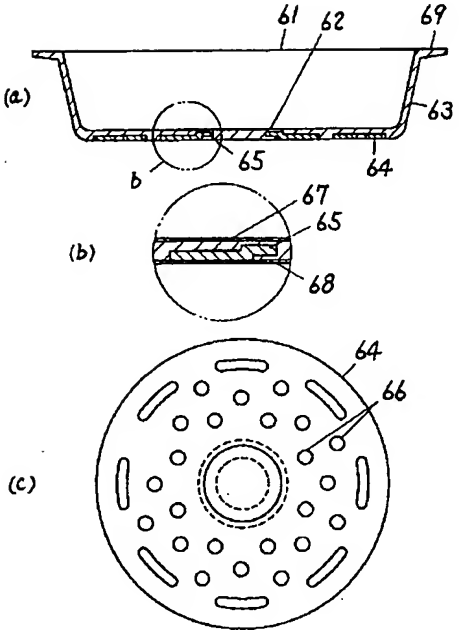
【図5】

51 鍋体
52 底板
53 側壁
54 磁性金属板
55 切り起こし片



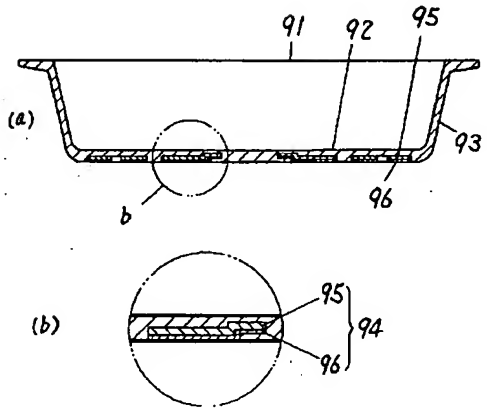
【図6】

61 鍋体
62 底板
63 側壁
64 磁性金属板
65 環状段部



【図7】

91　鍋体
92　底板
93　側壁
94　磁性金属板
95　アルミニウム層
96　ステンレス層



* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] The heated cooking utensil for electromagnetic-induction heating cooking devices cast to one so that it might have the pan body which consists of a non-magnetic metal ingredient with which a side attachment wall stands up, and the magnetic metal plate arranged in the rear face of said bottom plate, two or more bores might be prepared in this magnetic metal plate and this bore might be filled up with said non-magnetic metal ingredient from the periphery of a bottom plate.
[Claim 2] For the bore with which a magnetic metallic material is filled up, this outside surface side is the heated cooking utensil for electromagnetic-induction heating cooking devices according to claim 1 which comes to have the becoming inclination size.
[Claim 3] It is the heated cooking utensil for electromagnetic-induction heating cooking devices which has the pan body which consists of a non-magnetic metal ingredient with which a side attachment wall stands up from the periphery of a bottom plate, and the disc-like magnetic metal plate arranged in the rear face of said bottom plate, and arranged at least two or more bores which have a concentric circle arc while the periphery section of this magnetic metal plate is attached in one with said non-magnetic metal ingredient on the radius shaft.
[Claim 4] While arranging at least two or more 1st bore which has the pan body which consists of a non-magnetic metal ingredient with which a side attachment wall stands up, and the disc-like magnetic metal plate arranged in the rear face of said bottom plate, and has this and a concentric circle arc from the periphery of a bottom plate on a radius shaft The heated cooking utensil for electromagnetic-induction heating cooking devices cast to one so that two or more 2nd bores might be prepared between this 1st bore and this 2nd bore might be filled up with a non-magnetic metal ingredient.
[Claim 5] the pan body which consists of a non-magnetic metal ingredient with which a side attachment wall stands up from the periphery of a bottom plate, and the magnetic metal plate arranged in the rear face of said bottom plate -- having -- this magnetic metal plate -- plurality -- cutting -- a lifting piece -- forming -- this heated cooking utensil for electromagnetic-induction heating cooking devices cast to one so that it might cut and the vertical side of a lifting piece might be filled up with said non-magnetic metal ingredient.
[Claim 6] the pan body which consists of a non-magnetic metal ingredient with which a side attachment wall stands up from the periphery of a bottom plate, and the annular magnetic metal plate arranged in the rear face of said bottom plate -- having -- the center section of this magnetic metal plate -- the inside of a pan body -- a convex -- the heated cooking utensil for electromagnetic-induction heating cooking devices cast to one so that an annular step might be formed and the vertical side of this annular step might be filled up with said non-magnetic metal ingredient.
[Claim 7] claims 1-6 which used the pan body as aluminum or an aluminum alloy, and formed the inside of a magnetic metal plate with the clad plate which unified the aluminum layer and the outside in the stainless steel layer -- either -- the heated cooking utensil for the electromagnetic-induction heating cooking devices of a publication.

[Translation done.]

* NOTICES *

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to the heated cooking utensil for electromagnetic-induction heating cooking devices which has an exoergic means on a base.
[0002]
[Description of the Prior Art] Generally, although non-magnetic metal pans, such as an aluminum pan, cannot be heated in an electromagnetic-induction heating cooking device, it can be used for electromagnetic-induction heating cooking devices by performing various kinds of processings to a bottom-of-a-pan side.
[0003] About the heated cooking utensil for [conventional] this kind of electromagnetic-induction heating cooking devices, it had become a configuration as shown, for example in a "JP,61-27107,Y" number official report. That is, as shown in drawing 8 , after performing blasting processing to the pars basilaris ossis occipitalis 102 of the body 101 of a container made from aluminum or an aluminum alloy, the thing in which the thermal-spraying layer 103 of the iron as a magnetic material layer was formed was common. 104 shows an inner surface processing layer.
[0004]
[Problem(s) to be Solved by the Invention] In such a heated cooking utensil for the conventional electromagnetic-induction heating cooking devices, in order to obtain the output of 1 or more kws as the 1st technical problem, the thickness of the thermal-spraying layer 103 of the base of the body 101 of a container was needed 1.0mm from 0.5mm, and thermal spray material cost and this processing cost were size. For this reason, although it was desirable to determine the thickness of the thermal-spraying layer 103 by correlation with an output, and to form it thinly as much as possible, in processing of this kind, it is difficult to form the thickness of the thermal-spraying layer 103 in homogeneity, and it was not able to obtain the stable output. Furthermore, since the expansion coefficient of the aluminum which the thermal-spraying layer 103 may exfoliate and constitutes the body 101 of a container at the time of heating was size from a thermal spray material as the 3rd technical problem when a pan is fallen accidentally [it is weak, for example,] to an impact although this kind of thermal-spraying layer 103 is hard, the crack went into both the thermal-spraying layers 103, and a possibility which curvature generates that it might no longer be heated was in the bottom of a pan. These had become such a remarkable technical problem that a thermal-spraying layer is thickly formed in order to obtain high power.
[0005] This invention solves the above-mentioned technical problem, it is an easy configuration, and it is cheap, it is made strong and user-friendliness aims at offering the heated cooking utensil for electromagnetic-induction heating cooking devices improved into insurance by cooking.
[0006]
[Means for Solving the Problem] In order to attain the above-mentioned object, the 1st technical-problem solution means of this invention has the pan body which consists of a non-magnetic metal ingredient with which a side attachment wall stands up from the periphery of a bottom plate, and the

magnetic metal plate arranged in the rear face of said bottom plate, prepares two or more bores in this magnetic metal plate, and considers them as the configuration of the heated cooking utensil for electromagnetic-induction heating cooking devices cast to one so that this bore might be filled up with said non-magnetic metal ingredient.

[0007] This outside surface side of the bore with which a magnetic metallic material is filled up considers the 2nd technical-problem solution means as the configuration which has the inclination which becomes size.

[0008] The pan body with which the 3rd technical-problem solution means consists of a non-magnetic metal ingredient with which a side attachment wall stands up from the periphery of a bottom plate, While having the disc-like magnetic metal plate arranged in the rear face of said bottom plate and attaching the periphery section of this magnetic metal plate in one with said non-magnetic metal ingredient It considers as the configuration of the heated cooking utensil for electromagnetic-induction heating cooking devices which arranged at least two or more bores which have a concentric circle arc on the radius shaft.

[0009] The pan body with which the 4th technical-problem solution means consists of a non-magnetic metal ingredient with which a side attachment wall stands up from the periphery of a bottom plate, While arranging at least two or more 1st bore which has the disc-like magnetic metal plate arranged in the rear face of said bottom plate, and has this and a concentric circle arc on a radius shaft Two or more 2nd bores are prepared between this 1st bore, and it considers as the configuration of the heated cooking utensil for electromagnetic-induction heating cooking devices cast to one so that this 2nd bore might be filled up with a non-magnetic metal ingredient.

[0010] From the periphery of a bottom plate, the 5th technical-problem solution means has the pan body which consists of a non-magnetic metal ingredient with which a side attachment wall stands up, and the magnetic metal plate arranged in the rear face of said bottom plate, plurality turns it off to this magnetic metal plate, forms a lifting piece, and considers it as the configuration of this heated cooking utensil for electromagnetic-induction heating cooking devices cast to one so that it might cut and the vertical side of a lifting piece might be filled up with said non-magnetic metal ingredient.

[0011] The pan body with which the 6th technical-problem solution means consists of a non-magnetic metal ingredient with which a side attachment wall stands up from the periphery of a bottom plate, An annular step is formed. the annular magnetic metal plate arranged in the rear face of said bottom plate -- having -- the center section of this magnetic metal plate -- the inside of a pan body -- a convex -- It considers as the configuration of the heated cooking utensil for electromagnetic-induction heating cooking devices cast to one so that the vertical side of this annular step might be filled up with said non-magnetic metal ingredient.

[0012] The 7th technical-problem solution means uses the pan body of said 1-4th solution means as aluminum or an aluminum alloy, and considers the inside of a magnetic metal plate as the configuration which formed with the clad plate which unified the aluminum layer and the outside in the stainless steel layer.

[0013]

[Function] It has the pan body which consists of a non-magnetic metal ingredient with which a side attachment wall stands up from the periphery of a bottom plate with the 1st above-mentioned technical-problem solution means, and the magnetic metal plate arranged in the rear face of said bottom plate, and two or more bores are prepared in this magnetic metal plate, and since it cast to one so that this bore might be filled up with said non-magnetic metal ingredient, a heated cooking utensil only consists of very cheaply casting to one at the time of die-casting molding.

[0014] Even if the outside surface side of said magnetic metal plate writes as the configuration which prepared the bore which has the inclination which becomes size and carries out expansion contraction with heat, a magnetic metal plate does not separate from the 2nd technical-problem solution means.

[0015] Moreover, with the 3rd technical-problem solution means, since the periphery section of a magnetic metal plate arranged at least two or more bores which have a concentric circle arc on the radius shaft while being attached in one with said non-magnetic metal ingredient, the expansion contraction

stress of the periphery section is absorbed by this bore, and its curvature of a magnetic metal plate decreases.

[0016] Moreover, while the 4th solution means arranges at least two or more 1st bore which has a magnetic metal plate and a concentric circle arc on a radius shaft, two or more 2nd bores are prepared between this 1st bore, and since it cast to one so that this 2nd bore might be filled up with a non-magnetic metal ingredient, the expansion contraction stress which joins the nonmetal material with which the 2nd bore was filled up is unified certainly few.

[0017] Moreover, the pan body which consists of a non-magnetic metal ingredient with which a side attachment wall stands up with the 5th technical-problem solution means from the periphery of the configuration bottom plate of the heated cooking utensil for electromagnetic-induction heating cooking devices, It has the magnetic metal plate arranged in the rear face of said bottom plate, and plurality cuts to this magnetic metal plate, and a lifting piece is formed. Since [this] it cast to one so that it might cut and the vertical side of a lifting piece might be filled up with said non-magnetic metal ingredient, Even if an impact is added or it carries out expansion contraction with heat, a magnetic metal plate is not shaky and it is unified certainly.

[0018] Moreover, the pan body which consists of a non-magnetic metal ingredient with which a cylinder-like side attachment wall stands up from the periphery of a bottom plate with the 6th technical-problem solution means, the annular magnetic metal plate arranged in the rear face of said bottom plate -- having -- the center of this magnetic metal plate -- the inside of a pan body -- a convex, since the annular step was formed Even if it performs local heating with which reinforcement comes out enough, a pan is shifted for a certain reason, and it is heated even if it carries out expansion contraction with heat, torsion deformation of a magnetic metal plate can be prevented and the flatness of the bottom of a pan is secured.

[0019] Moreover, with the 7th technical-problem solution means, a pan body is used as aluminum or an aluminum alloy, the inside of a magnetic metal plate is written as the configuration which formed with the clad plate which unified the aluminum layer and the outside in the stainless steel layer, and since the plane of composition of a pan body and a magnetic metal plate has very few mutual differential thermal expansions, the stable junction condition without a clearance is acquired.

[0020]

[Example]

(Example 1) The 1st example of this invention is explained hereafter, referring to drawing 1 .

[0021] In drawing, 11 is a heated cooking utensil for electromagnetic-induction heating cooking devices, is a pan body with which the cylinder-like side attachment wall 13 stands up from the periphery of a bottom plate 12, and consists of an aluminum alloy. It consists of casts, such as a press cast which 14 is the magnetic metal plate of a circle configuration, and consists of iron of 1-3mm of board thickness, or a stainless steel plate of a ferrite system, or cast iron, and the bore 17 of the shape of 3rd slot prepares in the center at the 1st bore 15, and is prepared in this perimeter at two or more second bores 16 and the periphery section. 18 is a ****** resin coat which consists of a polytetraflouroethylene etc., and, outside, has formed the rust-proofing resin coat 19 which consists of silicon resin etc. 20 shows a handle.

[0022] In the above-mentioned configuration, the heated cooking utensil of this invention is processed by die-casting molding, and at the time of die-casting molding of said pan body, the magnetic metal plate 14 is in the condition by which positioning immobilization was carried out at metal mold, and is cast by the 3rd bore 17 at one. Therefore, although the 3rd bore 17 is not filled up with an aluminum alloy, it is cast so that the 1st bore 15 and 2nd bore 16 may be filled up with an aluminum alloy and an aluminum alloy may not flow into the outside surface of the magnetic metal plate 14. Immediately after molding, although compressive stress joins the magnetic metal plate 14 by contraction of a surrounding aluminum alloy since the coefficient of linear expansion of an aluminum alloy is size from it of the magnetic metal plate 14, it is absorbed by said 3rd bore 17 and the stress to the aluminum restoration section of the 1st bore 15 and the 2nd bore 16 is mitigated. The above is the same at the time of an activity, although the contraction at the time of molding is assumed. However, generally, in die-casting

molding, since it will be in an elevated-temperature condition 700 degrees C or more, very big contraction stress occurs immediately after molding, but since it is the temperature of 300 degrees C or less at the time of an activity, the stress beyond this does not occur. Although the 1st bore 15 was made into the restoration section in this invention, in order to absorb compressive stress further, it is good also as the non-filled up section, i.e., a hole. Since it generally becomes a high magnetic-flux part cloth band in a circle in this kind of cooking device, it is good to raise heat conduction from the magnetic metal plate 14 to a pan inner surface by making the 2nd bore 16 into the restoration section. Moreover, what is necessary is for the other molding approaches to be used although considered as aluminum die-casting molding, and just to cast to one the magnetic metal plate 14 which has the hole with which a nonmetal material is filled up in short, and the hole with which it does not fill up by this invention.

[0023] (Example 2) It explains, referring to drawing 2 about the 2nd example next.

[0024] In drawing, 21 is a heated cooking utensil for electromagnetic-induction heating cooking devices, is a pan body with which the cylinder-like side attachment wall 23 stands up from the periphery of a bottom plate 22, and consists of an aluminum alloy.

[0025] It consists of casts, such as a press cast which 24 is the magnetic metal plate of a circle configuration, and consists of iron of 1-3mm of board thickness, or a stainless steel plate of a ferrite system, or cast iron, and the bore 26 which has the 1st bore 25 in the center and has two or more second tapers to this perimeter is formed. 28 is a ****** resin coat which consists of a polytetraflouroethylene etc., and, outside, has formed the rust-proofing resin coat 29 which consists of silicon resin etc. 30 is a handle. 26a shows an angle R.

[0026] Since the 2nd bore 26 has become back taper-like in the above-mentioned configuration, even if the aluminum alloy with which this hole was filled up carries out expansion contraction with heat at the time of an activity, the magnetic metal plate 24 comes floating, or there is no possibility of separating. The outside surface side periphery section of the bore 26 which is this taper hole becomes easy to prevent the leakage in restoration by the outside surface (weld flash) by making it the shape of an edge at the time of molding. Moreover, it is desirable to prepare angle R 26a in the inner surface side periphery section, and to stabilize restoration of the aluminium alloy of the applicable section, and to avoid the stress concentration at the time of heating expansion.

[0027] (Example 3) It explains, referring to drawing 3 about the 3rd example next.

[0028] In drawing, 31 is a heated cooking utensil for electromagnetic-induction heating cooking devices, is a pan body with which cylinder-like **** 33 stands up from the periphery of a bottom plate 32, and consists of an aluminum alloy.

[0029] 34 consists of casts, such as a press cast which is the magnetic metal plate of a circle configuration and consists of iron of 1-3mm of board thickness, or a stainless steel plate of a ferrite system, or cast iron, and it has formed the 2nd bore 36 in the center while it arranges the 1st bore 35 which has a concentric circle arc so that more than one may be formed on a radius shaft at least. 37 is a ****** resin coat which consists of a polytetraflouroethylene etc., and, outside, has formed the rust-proofing resin coat 38 which consists of silicon resin etc. 39 shows a handle.

[0030] In the above-mentioned configuration, the heated cooking utensil of this invention is processed by die-casting molding, the 2nd bore 36 of this periphery section and a center is filled up with an aluminum alloy, and the magnetic metal plate 34 is cast by one. It is cast so that the 1st bore 35 may not be filled up with an aluminum alloy here and an aluminum alloy may not flow into the outside surface of the magnetic metal plate 34. Immediately after molding, although compressive stress joins magnetic metal plate 34 periphery by contraction of the aluminum alloy of a periphery since the coefficient of linear expansion of an aluminum alloy is size from it of the magnetic metal plate 34, it is absorbed by said 1st bore 35. Since at least two places of this 1st bore 35 are arranged on the radius shaft, stress is absorbed on the whole surface and its curvature of the magnetic metal plate 34 decreases. The above is the same at the time of an activity, although the contraction at the time of molding is assumed. However, generally, in die-casting molding, since it will be in an elevated-temperature condition 700 degrees C or more, very big contraction stress occurs immediately after molding, but since it is the temperature of 300 degrees C or less at the time of an activity, the stress beyond this does not occur.

[0031] (Example 4) It explains, referring to drawing 4 about the 4th example next.
[0032] In drawing, 41 is a heated cooking utensil for electromagnetic-induction heating cooking devices, is a pan body with which cylinder-like **** 43 stands up from the periphery of a bottom plate 42, and consists of an aluminum alloy.
[0033] It consists of casts, such as a press cast which 44 is the magnetic metal plate of a circle configuration, and consists of iron of 1-3mm of board thickness, or a stainless steel plate of a ferrite system, or cast iron. While arranging the 1st bore 45 which has a concentric circle arc so that more than one may be formed on a radius shaft at least, two or more 2nd bores 46 are formed between this 1st bore 45, and it has cast to one so that this 2nd bore 46 may be filled up with a non-magnetic metal ingredient. 47 is a ****** resin coat which consists of a polytetraflouroethylene etc., and, outside, has formed the rust-proofing resin coat 48 which consists of silicon resin etc. 49 shows a handle.
[0034] In the above-mentioned configuration, the heated cooking utensil of this invention is processed by die-casting molding, and the magnetic metal plate 44 is cast by one. Although the 1st bore 45 is not filled up with an aluminum alloy here, it is cast so that the 2nd bore 46 may be filled up with an aluminum alloy and an aluminum alloy may not flow into the outside surface of the magnetic metal plate 44. Immediately after molding, although compressive stress joins magnetic metal plate 44 periphery by contraction of a surrounding aluminum alloy since the coefficient of linear expansion of an aluminum alloy is size from it of the magnetic metal plate 44, it is absorbed by said 1st bore 45. Since at least two places of this 1st bore are arranged on the radius shaft, stress is absorbed on the whole surface and its curvature of the magnetic metal plate 44 decreases. Moreover, since the 2nd bore 46 is arranged between the 1st bore 45, since it is mitigated, the shearing stress of the aluminum restoration section of this 2nd bore 46 does not have a possibility that this bottom may be damaged by expansion contraction and the magnetic metal plate 44 may separate. The above is the same at the time of an activity, although the contraction at the time of molding is assumed. However, generally, in die-casting molding, since it will be in an elevated-temperature condition 700 degrees C or more, very big contraction stress occurs immediately after molding, but since it is the temperature of 300 degrees C or less at the time of an activity, the stress beyond this does not occur.
[0035] (Example 5) It explains, referring to drawing 5 about the 5th example next.
[0036] In drawing, 51 is a heated cooking utensil for electromagnetic-induction heating cooking devices, is a pan body with which the cylinder-like side attachment wall 53 stands up from the periphery of a bottom plate 52, and consists of an aluminum alloy.
[0037] 54 is the magnetic metal plate of a circle configuration, it consists of iron of 1-3mm of board thickness, or a stainless steel plate of a ferrite system, the plurality which stands up to a pan body inner surface side cuts, and the U character-like bore 56 is formed in this perimeter with the lifting piece 55. 57 is a ****** resin coat which consists of a polytetraflouroethylene etc., and, outside, has formed the rust-proofing resin coat 58 which consists of silicon resin etc. 59 shows a handle.
[0038] In the above-mentioned configuration, it is processed by die-casting molding, and, a bore 56 is cut, and it fills up with an aluminum alloy succeeding a lifting piece 55 up underside, and the heated cooking utensil of this invention is cast by one so that it may not turn to a magnetic metal plate outside surface. Moreover, the thickness of the aluminum alloy of the upper and lower sides of this end lifting piece 55 has set up said end lifting height so that it may become almost equal. For this reason, even if expansion contraction is repeated with heating, the magnetic metal plate 41 is not shaky and it is unified certainly.
[0039] Next, it explains, referring to drawing 6 about the 6th example. In drawing, 61 is a heated cooking utensil for electromagnetic-induction heating cooking devices, is a pan body with which the cylinder-like side attachment wall 63 stands up from the periphery of a bottom plate 62, and consists of an aluminum alloy.
[0040] casts, such as a press cast which 64 is the magnetic metal plate of a circle configuration, and consists of iron of 1-3mm of board thickness, or a stainless steel plate of a ferrite system, or cast iron, -- becoming -- a center section -- the inside of a pan body -- a convex -- it has the annular step 65 and two or more bores 66. 67 is a ****** resin coat which consists of 4 ****-ized ethylene etc., and, outside, has

formed the rust-proofing resin coat 68 which consists of silicon resin etc. 69 shows a handle.
[0041] Although the magnetic metal plate 64 is cast by this invention by one at the time of die-casting molding of said pan body and the vertical side and bore 66 of the annular step 65 are filled up with an aluminum alloy in the above-mentioned configuration at this time, it is cast so that an aluminum alloy may not flow in outside. Moreover, the thickness of the aluminum alloy of the upper and lower sides of the annular step 65 has set up stage height so that it may become almost equal. Deformation is prevented by the mechanical strength of said annular step 65, although it acts in die-casting molding so that deformation of a center section may become the largest by contraction of the aluminium alloy of the periphery section after molding. Although the above assumes the contraction at the time of molding, even if local heating of shifting and using a pan, for example at the time of an activity is carried out and expansion contraction is repeated, it is hard to produce torsion deformation. Although it generally has the alternate-magnetic-flux generating coil in a circle in this kind of cooking device, it is good to form the annular step 65 equal to a circumferential diameter.
[0042] (Example 7) It explains, referring to drawing 7 about the 7th example next.
[0043] In drawing, 91 is a heated cooking utensil for electromagnetic-induction heating cooking devices, is a pan body with which the cylinder-like side attachment wall 93 stands up from the periphery of a bottom plate 92, and consists of an aluminum alloy.
[0044] 94 is the magnetic metal plate of a circle configuration, the inside is formed in the aluminum layer 95 and the outside with the clad plate unified in the stainless steel layer 96, and other configurations are the same as an example 6.
[0045] Since one casts the magnetic metal plate 94 by this invention at the time of die-casting molding of said pan body and the aluminum alloy of the aluminum layer 95 of a clad plate and a pan body serves as a plane of composition in the above-mentioned configuration, there is no so-called molten-bath dislike, and stable molding is attained. Moreover, since the expansion difference at the time of an activity is also approximation, it always unifies, and since expansion contraction is carried out, a heated cooking utensil that heat conduction from the stainless steel layer 96 used as a heating layer is trustworthy and efficient is realizable. Moreover, the stainless steel layer 96 is good by the thickness of about 0.5mm, and serves as a lightweight heated cooking utensil. Although considered as the same configuration as said example 6 in this example, it cannot be overemphasized that it is possible also in the other examples.
[0046]
[Effect of the Invention] By casting a magnetic metal plate on a base also with non-magnetic metal, such as aluminum, at one, the heated cooking utensil for the electromagnetic-induction heating cooking devices of this invention can be made a very cheap and easy configuration, and can be heated so that more clearly than explanation of said example. Moreover, by forming the bore of a reverse draft in a magnetic metal plate, the blank of a magnetic metal plate can be prevented easily. Moreover, by preparing the slot which has a concentric circle arc in a magnetic metal disk, thermal expansion contraction stress is absorbed certainly and can form a strong base without curvature. Moreover, it is more certainly unified by preparing the slot which has a concentric circle arc in a magnetic metal disk, and arranging the bore with which a non-magnetic metal ingredient is filled up in the meantime. Moreover, a totter of the magnetic metal plate by thermal expansion contraction is certainly prevented by cutting to a magnetic metal plate at one, preparing a lifting piece, and filling up this vertical side with aluminium alloy. Moreover, by forming an annular step in a magnetic metal plate center section, even if it is sheet metal, it is firm, and torsion deformation of a magnetic metal plate can be prevented also to local heating. Moreover, by using a magnetic metal plate as a clad plate, the expansion differential shrinkage of a plane of composition becomes there are less, unification is secured certainly and efficient and good heat conduction is carried out. [very few]

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] (a) is the sectional view of the heated cooking utensil for the electromagnetic-induction heating cooking devices of the 1st example of this invention.
(b) is the elements on larger scale of the part which ****s in **** b in drawing 1 (a).
(c) is the top view of this magnetic metal plate.
[Drawing 2] (a) is the sectional view of the heated cooking utensil for the electromagnetic-induction heating cooking devices of the 2nd example of this invention.
(b) is the elements on larger scale of the part which ****s in **** b in drawing 2 (a).
(c) is rear-face drawing of this magnetic metal plate.
[Drawing 3] (a) is the sectional view of the heated cooking utensil for the electromagnetic-induction heating cooking devices of the 3rd example of this invention.
(b) is the elements on larger scale of the part which ****s in **** b in drawing 3 (a).
(c) is rear-face drawing of this magnetic metal plate.
[Drawing 4] (a) is the sectional view of the heated cooking utensil for the electromagnetic-induction heating cooking devices of the 4th example of this invention.
(b) is the elements on larger scale of the part which ****s in **** b in drawing 4 (a).
(c) is rear-face drawing of this magnetic metal plate.
[Drawing 5] (a) is the sectional view of the heated cooking utensil for the electromagnetic-induction heating cooking devices of the 5th example of this invention.
(b) is the elements on larger scale of the part which ****s in **** b in drawing 5 (a).
(c) is rear-face drawing of this magnetic metal plate.
[Drawing 6] (a) is the sectional view of the heated cooking utensil for the electromagnetic-induction heating cooking devices of the 6th example of this invention.
(b) is the elements on larger scale of the part which ****s in **** b in drawing 6 (a).
(c) is rear-face drawing of this magnetic metal plate.
[Drawing 7] (a) is the sectional view of the heated cooking utensil for the electromagnetic-induction heating cooking devices of the 7th example of this invention.
(b) is the elements on larger scale of the part which ****s in **** b in drawing 7 (a).
[Drawing 8] The sectional view of the heated cooking utensil for the electromagnetic-induction heating cooking devices of the conventional example
[Description of Notations]
11 Pan Body
12 Bottom Plate
13 Side Attachment Wall
14 Magnetic Metal Plate
16 Bore
